AMENDMENTS TO THE CLAIMS

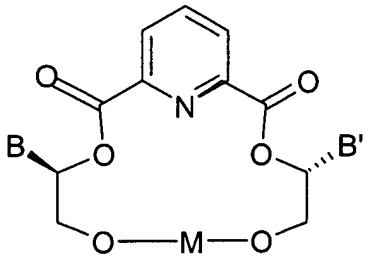
Please amend the claims in the manner indicated below. In the following amendments, an underline is used to indicate added text, and strikeouts are used to indicate deleted text. The amendment to claim 22 is to correct a typographical error. As such, no new matter has been added to the claims.

CLAIMS

1. (original) A composition for selectively binding an amine or amino acid target enantiomer over its counter-enantiomer, comprising:

a solid support;

an optically active ligand tethered to or coated on the solid support, said ligand having the structure:



where B and B' are independently bulky groups; and M is saturated $-C_2H_3-$ or saturated $-C_2H_30C_2H_4-$when M is tethered to the solid support, or M is saturated $-C_2H_4-$or saturated $-C_2H_40C_2H_4-$ when M is coated on the solid support; and

a hydrophobic organic solvent coating coated on the solid support

2. (currently amended) A composition as in claim 1, wherein B and B' are configured to ~~substantially~~ allow the target enantiomer to bind to the composition, said B and B' being further configured to substantially sterically hinder the counter-enantiomer from binding to the composition

3. (original) A composition as in claim 1, wherein B and B' are independently selected from the group consisting of aromatic, lower branched alkyl having from 3 to 10 carbon atoms, and lower straight alkyl having from 3 to 10 carbon atoms.

4. (original) A composition as in claim 3, wherein B and B' are independently selected from the group consisting of naphthyl, pyridyl, anthracyl, phenanthryl, benzonaphthyl, phenyl, and combinations thereof.

5. (original) A composition as in claim 3, wherein B and B' are phenyl.

6. (original) A composition as in claim 3, wherein B and B' are independently lower branched alkyl having from 4 to 10 carbon atoms.

7. (original) A composition as in claim 6, wherein B and B' are t-butyl.

8. (original) A composition as in claim 1, wherein the hydrophobic organic solvent is selected from the group consisting of methylene chloride, chloroform, dichloroethane, benzene, toluene, xylene, hexane, octane, and combinations thereof.

9. (original) A composition as in claim 1, wherein the solid support is a porous or non- porous organic polymer.

10. (original) A composition as in claim 1, wherein the solid support is a porous or non-porous inorganic particulate.

11. (original) A composition as in claim 1, wherein the optically active ligand is coated on the solid support.

12. (original) A composition as in claim 11, wherein the hydrophobic organic solvent is coated over the optically active ligand after the optically active ligand is coated on the solid support.

13. (original) A composition as in claim 11, wherein the hydrophobic organic solvent and the optically active ligand are coated on the solid support as a single coating.

14. (original) A composition as in claim 1, wherein the optically active ligand is a diketo- pyridine-15-crown-5.

15. (original) A composition as in claim 1, wherein the optically active

ligand is a diketo-pyridine-18-crown-6.

16. (original) A composition as in claim 1, wherein the optically active ligand is tethered to the solid support, and the composition is defined by the structure:

SS-A-X-L

wherein SS is the solid support, said solid support being a porous or non-porous inorganic particulate or organic polymer, A is a covalent linkage mechanism, X is a hydrophilic spacer grouping, and L is the optically active ligand, with the proviso that when SS is the organic polymer, A-X may be combined as a single covalent linkage.

17. (original) A composition as in claim 16, wherein SS is an organic polymer solid support selected from the group consisting of polyacrylate, polystyrene, polyphenol, and combinations thereof.

18. (original) A composition as in claim 17, wherein A and X are combined and are represented by the formula:

$$-(CH_2)_x-(Y)_y-(CH_2)_z-$$

where y is 0 or 1 ; x and z are independently 0 or integers from 1 to 10; and Y is member selected from the group consisting of 0, S, C=N, CO, CONH, CSNH, COO, CSO, NH, N-lower alkyl, SO, SO_2, $S0_2NH$, C_6H_4 and $CH_2C_6H_4$, with the proviso that at least one of x, y, and z must be at least 1.

19. (original) A composition as in claim 16, wherein SS is an inorganic solid support selected from the group consisting of sand, silica gel, glass, glass fibers, alumina, zirconia, titania, nickel oxide, and combinations thereof.

20. (original) A composition as in claim 19, wherein A is -Si(Z,Z')-0-, wherein Z and Z' are independently selected from the group consisting of Cl, Br, I, lower alkyl, lower alkoxy, substituted lower alkyl, substituted lower alkoxy, and 0-bound to SS.

21. (original) A composition as in claim 19, wherein X is represented by

the formula:

$$(CH_2)_a,(OCH_2CHR^1CH_2)_b$$

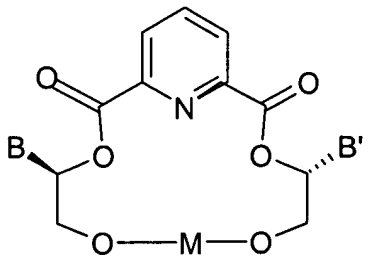
wherein R^1 is a member selected from the group consisting of H, SH, OH, lower alkyl, and aryl; a is an integer from 3 to 10; and b is 0 or 1.

22. (currently amended) A method for concentrating, removing, and separating an amine or amino acid target enantiomer from its counter-enantiomer present in a source solution containing an enantiomeric mixture comprising the steps of:

(a) contacting the source sdution with a composition having the structure:

(i) a solid support;

(ii) an optically active ligand tethered to or coated on the solid support having the structure:



where B and B' are independently bulky groups; and M is saturated $-C_2H_3-$ or saturated

$-C_2H_30C_2H_4-$ when M is tethered to the solid support, or M is saturated $-C_2H_4-$ or saturated $-C_2H_40C_2H_4-$ when M is coated on the solid support; and

(iii) a hydrophobic organic solvent coating,

wherein the composition has an affinity for the amine or amino acid target enantiomer over its counter-enantiomer, and wherein upon contacting, the target enantiomer is preferentially complexed to the composition;

(b) removing the source solution from contact with the composition to which has the target enantiomer has been complexed;

(c) contacting the composition having the target enantiomer complexed

thereto with a second volume of an aqueous receiving solution such that the target enantiomer is separated from the composition; and

(d) recovering the target enantiomer in concentrated form in the receiving

solution.

23. (original) A method as in claim 22, wherein the target enantiomer is substantially soluble in the receiving solution, and (i) the receiving solution has greater affinity for the target enantiomer than does the composition, (ii) the receiving solution has a greater affinity for the composition than does the target enantiomer, or (iii) the receiving solution eliminates the binding strength or mechanism of binding of the target enantiomer to the composition, thereby quantitatively stripping the target enantiomer from the ligand.

24. (currently amended) A method as in claim 22, wherein B and B' are configured to ~~substantially~~ allow the target enantiomer to bind to the composition, said B and B' being further configured to substantially sterically hinder the counter-enantiomer from binding to the composition.

25. (original) A method as in claim 22, wherein B and B' are independently selected from the group consisting of aromatic, lower branched alkyl having from 3 to 10 carbon atoms, and lower straight alkyl having from 3 to 10 carbon atoms.

26. (original) A method as in claim 22, wherein the hydrophobic organic solvent is selected from the group consisting of methylene chloride, chloroform, dichloroethane, benzene, toluene, xylene, hexane, octane, and combinations thereof.

27. (original) A method as in claim 22, wherein the solid support is an organic polymer selected from the group consisting of polyacrylate, polystyrene, and polyphenol, and combinations thereof.

28. (original) A method as in claim 22, wherein the solid support is an inorganic solid support selected from the group consisting of sand, silica gel, glass, glass fibers, alumina, zirconia, titania, nickel oxide and combinations thereof.

29. (original) A method as in claim 22, wherein the ligand is coated on the solid support.

30. (original) A method as in claim 29, wherein the hydrophobic organic solvent is coated over the ligand after the ligand is coated on the solid support.

31. (original) A method as in claim 29, wherein the hydrophobic organic solvent and the ligand are coated on the solid support as a single coating.

32. (original) A method as in claim 22, wherein the optically active ligand is a diketo- pyridine-15-crown-5.

33. (original) A method as in claim 22, wherein the optically active ligand is a diketo- pyridine-18-crown-6.

34. (original) A method as in claim 22, wherein the target enantiomer and its counter- enantiomer is a β-amino acid.

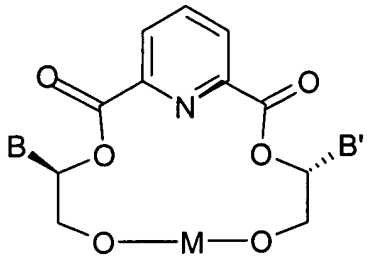
35. (original) A method as in claim 22, wherein the target enantiomer and its counter- enantiomer is an aromatic α-amine.

36. (original) A non-chromatographic method of separating an enantiomeric molecule from its counter-enantiomer, comprising:

(a) flowing a racemic feed solution containing a target enantiomer and its counter-enantiomer through a separation device, said separation device including a first composition comprising:

(i) a solid support;

□ (ii) an optically active ligand tethered to or coated on the solid support having the structure of Formula 1 below:



Formula 1

where B and B' are independently bulky groups; and M is saturated $-C_2H_3-$ or saturated

$-C_2H_30C_2H_4-$ when M is tethered to the solid support, or M is saturated $-C_2H_4-$ or saturated $-C_2H_40C_2H_4-$ when M is coated on the solid support; and

(iii) a hydrophobic organic solvent coating,

wherein the first composition has an affinity for the target enantiomer and a selectivity of at least 4;

(b) selectively forming a complex between the target enantiomer and the first composition, thereby forming a first raffinate having increased purity of the counter- enantiomer;

(c) breaking the complex between the target enantiomer and the first composition with a second volume of an aqueous receiving solution to form a target enantiomer enhanced receiving liquid;

(d) flowing the target enantiomer enhanced receiving liquid through a second separation device, said second separation device including a second composition having the structure of Formula 1, but having an opposite optical activity with respect to the first composition; and

(e) selectively forming a complex between the counter-enantiomer and the second composition in the second separation device, thereby forming a second raffinate having increased purity of the target enantiomer.